REMARKS/ARGUMENTS

The claims are 1-10. Claim 1 has been amended to improve its form. In addition, the specification has been amended to make certain clarifications as requested by the Examiner. Reconsideration is expressly requested.

The disclosure was objected to for using the term "fiber having a negative group velocity dispersion", which the Examiner believed referred to what is called a "dispersion compensating fiber" or a "negative dispersion fiber". In response, Applicants have amended the specification to clarify that a fiber with a negative group velocity dispersion is operated in the anomalous-dispersion regime and a fiber with a positive group velocity dispersion is operated in the normal dispersion regime.

The term "fiber having a negative group velocity dispersion" is not a "dispersion compensating fiber" or a "negative dispersion fiber" as suggested by the Examiner. For example, a standard telecommunication glass fiber (at a wavelength of 1.55 μm) has a negative group velocity dispersion ($\beta_2 < 0$ ps^2/m). Such a standard telecommunication glass fiber is explicitly not a

"dispersion compensating fiber," because such a fiber must necessarily have a reverse sign of the group velocity dispersion.

As the Examiner requested that the application be clarified, Applicants have amended the specification to use the terms "normal-dispersion regime" (for values of the group velocity dispersion of $\beta_2 > 0$) and "anomalous-dispersion regime" (for values of the group velocity dispersion of $\beta_2 < 0$). It is respectfully submitted that the foregoing amendment overcomes the objections of the Examiner to the specification, and Applicants respectfully request that the rejections on this basis be withdrawn.

Claims 1-10 were rejected under 35 U.S.C. §112, second paragraph as being indefinite. Specifically, the Examiner believed that the claims were incomplete in omitting structural cooperative relationships between the laser, amplifier, and stretcher.

In response, Applicants have amended claim 1 to improve its form as requested by the Examiner, thereby clarifying the design arrangement of the individual optical elements and their

connection. It is respectfully submitted that all currently pending claims fully comply with U.S.C. 112, second paragraph, and Applicants respectfully request that the objections on this basis be withdrawn as well.

Claims 1-3 and 5-6 were rejected under 35 U.S.C. 102(b) as being anticipated by *Galvanauskas et al. U.S. Patent No. 5,847,863*. The remaining claims were rejected under 35 U.S.C. 103 as being unpatentable over *Galvanauskas et al.* alone (claim 4) or further in view of *Richardson et al. U.S. Patent Application Publication No. 2003/0156605* (claims 7-10). Essentially, the Examiner's position was that *Galvanauskas et al.* discloses the device for amplifying light pulses recited in the claims except for features that are either considered within the skill of the art or disclosed by *Richardson et al.*

This rejection is respectfully traversed.

As set forth in claim 1, as amended, Applicants' invention provides a device for amplifying light pulses including a pulsed laser light source for producing light pulses having an optical spectrum, an optical stretcher coupled to the light pulses

emitted by said laser light source for temporally stretching the light pulses of the pulsed laser light source, and an optically pumped amplifier fiber arranged to receive the light pulses from the optical stretcher for amplifying and temporally compressing the light pulses. The amplifier fiber has a positive group velocity dispersion and non-linear optical properties so that the optical spectrum of the light pulses is broadened during amplification of the light pulses by taking advantage of non-linear self-phase modulation. In this way, Applicants' invention provides a device that allows the production of femtosecond light pulses having high energy purely by using fiber optics and avoids as far as possible the disadvantages attributable to frequency doubling.

None of the cited references disclose or suggest a device for amplifying light pulses in which an optically pumped amplifier fiber amplifies and temporally compresses light pulses from an optical stretcher so that the optical spectrum of light pulse is broadened during amplification of the light pulses by taking advantage of non-linear self-phase modulation. The primary reference to *Galvanauskas et al.* fails to disclose or suggest the amplification and compressing of the light pulses at

the same time, by means of an optically pumped amplifier fiber, as recited in claim 1, as amended. Instead, *Galvanauskas et al.* shows, in Fig. 1a, an arrangement in which a short light pulse (P) leaves the light source, and is subsequently stretched in terms of time and amplified. The amplified pulse (AP) evidently has a clearly longer pulse duration than at the beginning. For this reason, a separate optical compressor in the form of a grating compressor is additionally required in the *Galvanauskas et al.* system. In the case of Applicants' device as recited in claim 1, as amended, however, because of the compression in the amplifier fiber, additional subsequent compression is entirely unnecessary, or at the very least clearly less than in the case of *Galvanauskas et al.*

Moreover, as recited in claim 1, as amended, the optical spectrum of the light pulses is broadened during the amplification process, which is different than the system of *Galvanauskas et al.* In *Galvanauskas et al.*, it is explained, in column 18, starting with line 20, that the amplification of the light pulses in *Galvanauskas et al.'s* system is accompanied by a narrowing of the spectral band width, which corresponds to a corresponding lengthening of the pulse duration of the light

pulses. This phenomenon is also referred to as "gain narrowing" in the case of so-called "chirped pulse amplification" that is the matter of concern in the *Galvanauskas et al.* patent. However, the problems associated with "gain narrowing" are eliminated with the device for amplifying light pulses as recited in Applicants' claim 1, as amended.

The defects and deficiencies of the primary reference to *Galvanauskas et al.* are nowhere remedied by the secondary reference to *Richardson et al.* *Richardson et al.* discloses a pulse light source that includes a laser oscillator, a pulse selector and a fiber amplifier cascade. However, there is no disclosure or suggestion of a device for amplifying light pulses that uses an optical fiber by means of which amplification of the light pulses and compression of the light pulses as well as broadening of the optical spectrum take place simultaneously in accordance with Applicants' claim 1, as amended. Accordingly, it is respectfully submitted that claim 1, as amended, and dependent claims 2-10, which depend directly or indirectly thereon, are patentable over the cited references.

In summary, claim 1 has been amended together with the specification. In view of the foregoing, it is respectfully requested that the claims be allowed and that this case be passed to issue.

Respectfully submitted,
FLORIAN TAUSER ET AL. - 1

COLLARD & ROE, P.C.
1077 Northern Boulevard
Roslyn, New York 11576
(516) 365-9802
FJD:djp

Allison C. Collard, Reg.No.22,532
Edward R. Freedman, Reg.No.26,048
Frederick J. Dorchak, Reg.No.29,298
Attorneys for Applicant

Enclosures: Copy of Petition for 3 month extension

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 17, 2006.

Kelly Espitia